

IMPROVING ACCESSIBILITY TO PUBLIC BUILDINGS: A CO-DESIGN APPROACH

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ABSTRACT

A co-design approach supporting access to public buildings for individuals with physical disabilities in renovation/conception projects has been developed by the *Quebec City/CIRRIS/IRDPQ partnership*. This approach, tested through the renovation project of an existing community center, was divided in 3 phases: 1) addition of a gymnasium, 2) addition of an outdoor pool/reconfiguration of exterior spaces, and 3) renovation of the existing building/addition of a library. This paper focuses on the ongoing phase 1. The process allowed the effective operationalization of the approach. Even if the propositions made to enhance accessibility would likely increase construction costs, the steps leading to their establishment would probably be more cost effective since they limit the need for future changes to meet the users' needs. This approach might be a more effective way of providing accessibility solutions in public buildings to favour community participation of all citizens.

BACKGROUND

A recent partnership established between *Quebec City* representatives, researchers at the *Centre interdisciplinaire de recherche en réadaptation et intégration sociale (CIRRIS)* and health professionals at the *Institut de réadaptation en déficience physique de Québec (IRDPQ)*, aims at reducing social exclusion of individuals with disabilities by putting forward a generalization of universal accessibility of the built environment, technologies and collective services. Based on a co-design approach (Morales, Rousseau, & Passini, 2012), the partners and other community partners worked together to develop, apply and follow up on solutions and best practices, in order to reduce systemic obstacles to community participation of people with physical disabilities (mobility, hearing or visual impairments). Contrary to the previous approach led by the city representatives, the co-design approach showed early benefits thanks to an increased sensitivity to accessibility concerns expressed by all partners. Actually, when renovating or building facilities, the usual procedure proposed by *Quebec City* included the hiring of a private architecture firm which was asked to include in their work accessibility recommendations which can be found in the *Guide pratique d'accessibilité universelle* (Service de l'aménagement du territoire de la Ville de Québec, 2010).

This document is composed of 17 categories of infrastructures. It includes objective and measurable accessibility criteria considered as minimal for interior and exterior access (ramps, main entrances, information and signage, handrails and railings, interior and exterior stairs, etc.). This was then followed by the revision of the plans by *Quebec City's* architects and the consultation of health professionals and community members, if needed to better understand accessibility concerns for specific clientele. However, no systematic process was established to discuss accessibility issues, which limited expertise transfer between partners, leading to a reduced progress of measures taken to provide accessible facilities in the city. On one hand, this lack of systematic approach made health professionals unsatisfied not to be able to provide their advice or accessibility concerns at an appropriate timing. On the other hand, the architects were less inclined to consider the clinicians' concerns, which in some cases might have required major changes.

As mentioned by Iwarsson, Fänge, Hovbrandt, Carlsson, Jarbe and Wijk (2004), it is futile to bring changes to the built environment for better accessibility if other obstacles are created or if the accessibility situation is not considered as a whole. According to Pierce (1998), environmental obstacles limit independence of individuals with physical disabilities, influence others' attitude and sometimes bring misunderstanding of the situations lived by those individuals, leading to a lack of implication of the population in general in decision making regarding the development of accessible facilities. This is why, in 2012, when *Quebec City* planned to add a gymnasium in a community center (*Lebourgneuf's community center*), the partners mentioned above were consulted in order to better take advantage of each of their strengths. *Quebec City*, as a municipal entity, cares about the participation of its citizens. The co-design approach, consisting in the "active collaboration between the participant and researcher/designer to come up with new ideas for possible design solutions to solve the user's problems" (Morales, Rousseau, & Passini, 2012), was used through the construction of a gymnasium in an already existing community center. This approach includes four steps: 1) exploration to better understand the problems experienced by the users (feelings and experiences) and reflexive thinking, 2) co-design by the active collaboration of the participants/researchers/designers to identify

solutions, 3) validation with specialists, and 4) development of the validated ideas (Morales, Rousseau, & Passini, 2012). Even though the first step was not formally performed (users consultation), all other steps are followed in the current project. This whole process shed light on the benefits of using this approach has become an opportunity to experiment through exchanges among parties and to propose solutions that would better serve the ultimate goal of accessibility for the citizens of Quebec City.

PURPOSE

The purpose of this article is: 1) to describe the principles/steps on which the co-design approach was based, combining the efforts of the *City* representatives, health professionals, researchers and community members, in order to improve accessibility of a public community center, and 2) to present the results of this process.

APPROACH

Description of the approach

The co-design approach for this conception project required the participation of many individuals (see Table 1).

Table 1: Participants of the partnership

	<i>Profession</i>
<i>Quebec City</i>	Architect (extern architecture firm)
	Architect-coordinator (Project administration and construction division)
	Consultant (Leisure, sports, and community life division)
	Landscape architect (Design, architecture and heritage division)
	Senior architect (Project administration and construction division, buildings and parks section)
<i>CIRRIS</i>	Architect-researcher
<i>CIRRIS and IRDPQ</i>	Occupational therapist (Support to social integration Program) and master's degree student (experimental medicine)
<i>IRDPQ</i>	Administrative support (Visual impairment Program)
	Occupational therapist (Support to social integration Program)
	Orientation & mobility specialist (Visual impairment Program)
<i>Other</i>	Community representative (wheelchair user)

Table 2: Co-design approach's sub-steps

1. Establishment of the work team and description of the project
<ul style="list-style-type: none"> ◆ <i>Quebec City's</i> representatives define the project, hire a private architecture firm to design the plans, and contact the partners. ◆ The project is described in terms of use of the building, modifications to the physical environment to be made (i.e. addition of a gymnasium), and target clientele who will use the facility (i.e. if the facility is dedicated to individuals with physical disabilities or not).
2. Evaluation of the existing facility (should it be required)
<ul style="list-style-type: none"> ◆ Evaluation used: <i>Measure of accessibility to urban infrastructures for adults with physical disabilities (MAUAP)</i>, a measure of accessibility to parking lots, pedestrian facilities, building access, interior manoeuvring areas, places for learning and leisure, services and public restrooms, this being for adults with physical disabilities. (Gamache, Vincent, McFadyen, Routhier, Beauregard, & Fiset, (submitted); Gamache, Vincent, McFadyen, Routhier, Beauregard, Fiset, Robitaille, & Boucher, (submitted)). ◆ Presentation of an evaluation report to the partners. ◆ Comparison of the level of accessibility before and after the project can be done. (re-evaluation of the facility, if it is an existing facility)
3. Presentation of the plans at different stages of the project
<ul style="list-style-type: none"> ◆ A meeting is scheduled by the <i>Quebec City's</i> architect in charge of the project for each of the following stages: concept (25 % completed), preliminary plans, 40 % completed, and 90 % completed. This person is also in charge of structuring discussions during the meetings. ◆ To ensure a convivial work environment allowing open conversations, the partners are reminded that this procedure, being totally new for all parties, requires total openness. Readjustments are to be considered normal and necessary as the project evolves. Every comment/concern is a good one and is welcomed. ◆ Comments/suggestions/questions are made during the meetings as the subject is presented. The partners are asked to identify the basis of their recommendations (construction norms, valid measures, clinical experience).
4. Accessibility analysis and recommendations by the partners
<ul style="list-style-type: none"> ◆ The participants have five days after each meeting to forward comments/suggestions/questions to the <i>Quebec City's</i> architect in charge of the project. He/she then summarizes the forwarded information and transfers it to the private architecture firm. ◆ After each meeting, a written report of the discussed subjects, comments/suggestions/questions and proposed solutions is forwarded to all partners. ◆ This report is discussed at the beginning of the following meeting. All points which required actions from any of the partners are then put back on the table for discussion.
5. Final report
<ul style="list-style-type: none"> ◆ This final report includes all the undertaken steps, the different issues discussed collectively and the optimal solutions deemed acceptable for access to the facility. It also includes, if such is the case, the comparative evaluation of the facility's accessibility level before and after the project.

An initial condition to ensure the success of this approach was to find the right fit or balance between the needs of the three organizations, which have different functioning and, to some extent, are unaware of the other organizations' constraints. Therefore, in order to meet the

partners needs (access to municipal buildings (*Quebec City*), knowledge creation, scientific testing of accessibility solutions (*CIRRI*), and interventions for a better access for people with disabilities (*IRDPQ*)), it was necessary to establish an initial work plan, which could be amended, but served as the main pillar to the construction of collaborations, knowledge transfer and problem solving. The following sub-steps were established as the basis of this co-design approach to fulfill the main steps mentioned above (see Table 2).

Issues discussed for the conception of the gymnasium

Issues and recommendations which were discussed collectively, formulated in sub-steps 3 and 4, previously mentioned in Table 2, are presented in Table 3. All elements found in the *Guide pratique d'accessibilité universelle* (Service de l'aménagement du territoire de la Ville de Québec, 2010) were taken into consideration in the conception project. Environmental characteristics not found in the following table did not pose any issue.

Table 3: Discussed issues and recommendations

Issues	Recommendations
Access	
◆ Ground-level access	◆ Door large enough (865 mm), opening onto a firm and level surface on the same level (without steps)
Stairs	
◆ Configuration of the stairs and railings	◆ Steps at 90° with the railing (normal and integrated conception of stairs by individuals with perceptual disabilities)
◆ Raisers	◆ Closed (reduce risk of falls for individuals with perceptual disabilities)
◆ Headroom under the stairs	◆ Block circulation areas were headroom is under 2 m high
Wall surfaces and fenestration	
◆ Glare and control exterior natural light	◆ Presence of a palestra in front of the windows in the gymnasium and of window treatments elsewhere
◆ Absence of protection (wheelchair footrests)	◆ 30 cm protection at the bottom of every window or glass wall
Circulation areas and hallways	
◆ Floor surface	◆ Slip resistant ◆ Non glare ◆ Of contrasting colour with the walls
◆ Obstacles and free manoeuvring areas (easy understanding of one's location according to the environment)	◆ Obstacles located on the same side of the hallway ◆ Always favour 90° angles for easy localization or presence of tactile and visual cues to orient users
◆ Signage and orientation	◆ Uniform signage throughout the building answering accessibility requirements in the <i>Guide pratique d'accessibilité universelle</i> (Service de l'aménagement du territoire de la Ville de Québec, 2010) ◆ Oversized contrasting indications on the floor ◆ Contrast between the floor and the walls as well as between the walls and door frames
◆ Adaptation to facilitate walking in hallways	◆ Handrails on the walls in high-traffic hallways
Doors	
◆ Strength required to open	◆ Automatic door openers for doors which need to stay closed or, otherwise, light doors
◆ Safe use	◆ If the door pivots towards oneself, the handle is on the left, making the door pivot to the right for people with guide-dogs ◆ If the door pivots in the opposite direction, the handle is on the right ◆ Presence of a vertical window allowing to see if someone is on either side of the door
Gymnasium	
◆ Facility not dedicated to activities for individuals with physical disabilities, but which may be used for such activities	◆ Configuration of lines in the gymnasium allowing the use either of two regular courts (side by side) or of one court oriented perpendicularly to the two regular courts. This gives a free space of 6 m on each side of this single court for wheelchair storage if necessary
◆ Area available to store unused wheelchairs	◆ Synthetic floor surface, not adherent, low glare, easy to maintain
◆ Floor surface compatible with wheelchair users' needs	◆ Reduce distances between accessible installations ◆ Ensure free manoeuvring areas of 1500 mm in diameter ◆ Ensure easy approach of the installations by eliminating obstacles (i.e. benches, trashcans) ◆ Presence of grab bars in non-accessible shower stalls ◆ Free space to leave strollers ◆ Presence of alarm buttons in the accessible stalls ◆ Presence of water fountains at two different heights ◆ Ensure free manoeuvring areas of 1500 mm in diameter
◆ Locker rooms (number of accessible stalls and lockers, location, adaptations)	◆ Ensure easy approach of the installations by eliminating obstacles (i.e. benches, trashcans) ◆ Presence of alarm buttons in the accessible stalls
◆ Toilets (number of accessible stalls, location, adaptations)	

DISCUSSION AND CONCLUSION

Aiming at creating a more effective working environment and approach valorizing the input of all partners, the *Quebec City/CIRRI/IRDPO co-design approach* experimented during the conception project of a gymnasium in an existing community center in Quebec City seems to be very promising. It should be experimented, documented and refined in other projects, in Quebec City and in other cities. Compared to a regular non-accessibility approach, additional discussions and plan modifications based on the partners' recommendations were required. While the construction of a more accessible facility can entail additional costs, on a long-term basis, this approach might prove to be more cost effective. As a matter of fact, since accessibility is considered from the very beginning, practical solutions can be taken into account before the construction has begun and no future adaptations are required to meet the users' needs.

The overall process allowed better understanding of the strengths and roles of all parties as well as constructive exchanges of accessibility solutions. Each partner's input was beneficial and the amalgamation of everyone's concerns and suggestions allowed the global consideration of access to the facility, which might prove to be beneficial from an access for all perspective. Even if the partners are solicited for their specific expertise, as they become more experienced with this approach, they benefit from the knowledge they gather along the way through discussions with the others parties. Moreover, they increase their awareness regarding the partners' reality and constraints and, therefore, can analyze accessibility of the built environment in a more comprehensive and global manner.

This approach still needs to be perfected and adapted to various situations, but the obtained results seem to demonstrate a promising way of tackling an accessibility project. It is to be known that this kind of co-design approach requires flexibility, and open-mindedness. A proposed solution might be acceptable for a partner but create difficulties for the other and/or be too costly for someone else. That is why, ultimately, a consensus should be reached collectively in order to consider accessibility solutions as globally as possible to serve most users.

Such initiative should be implanted in different projects, both for private and public sectors. We hope that this approach will be used in the future for municipal renovation and conception projects and that it will allow better understanding and integration of accessibility for individuals with physical disabilities in all projects. It would also be very interesting to experimentally demonstrate the benefits associated with the use of this approach.

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